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Instrument Set-up

Introduction

The safety instructions and the user manual should be read through carefully before the product is used for the first time.

The person responsible for the product must ensure that all users understand these directions and adhere to them.

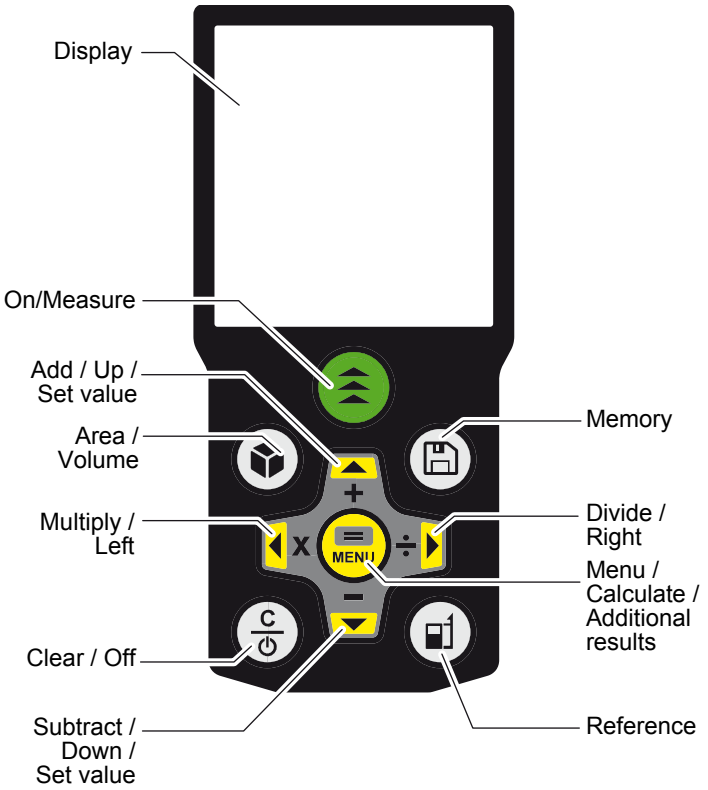
The symbols used have the following meanings:

⚠ WARNING
Indicates a potentially hazardous situation or an unintended use which, if not avoided, will result in death or serious injury.

⚠ CAUTION
Indicates a potentially hazardous situation or an unintended use which, if not avoided, may result in minor injury and/or appreciable material, financial and environmental damage.

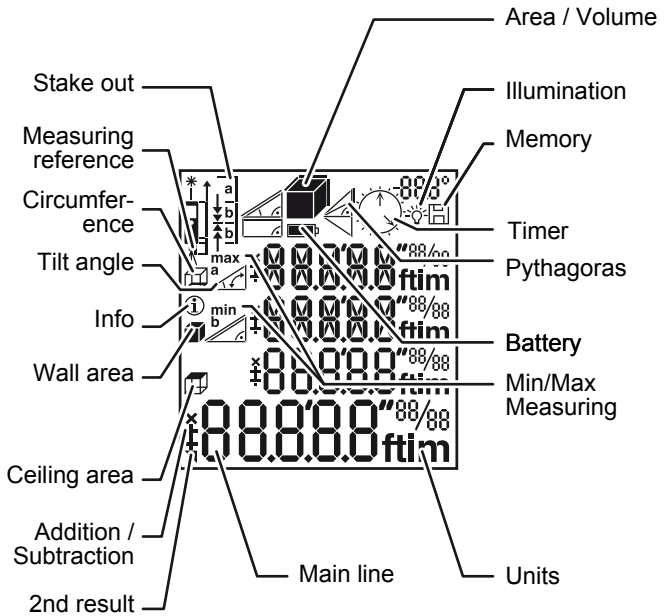
i Important paragraphs which must be adhered to in practice as they enable the product to be used in a technically correct and efficient manner.

Overview

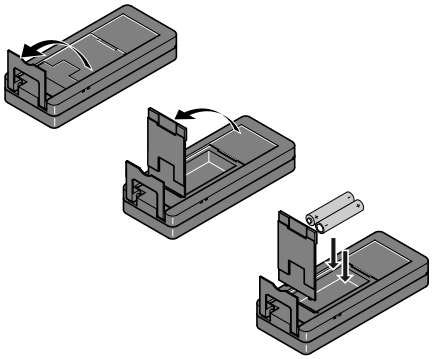


Instrument Set-up

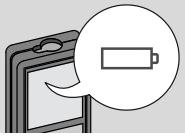
Display



Insert batteries

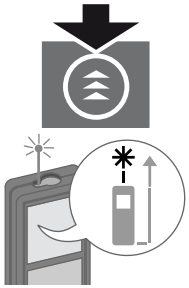


i To ensure a reliable use, do not use zinc-carbon batteries. Change batteries when battery symbol is flashing.



Operations

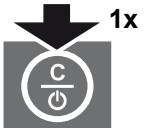
Switching ON/OFF



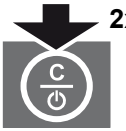
Press ON button 2 sec to start continuous laser mode. If no key is pressed for 180 sec, the device switches off automatically.

Device is turned OFF.

Clear



Undo last action.



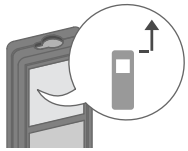
Leave actual function, go to default operation mode.

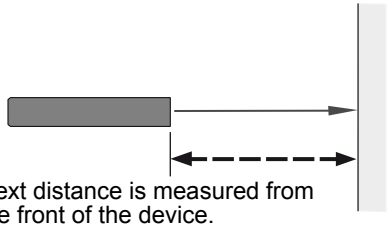
Message Codes

If the message "**InFo**" appears with a number, observe the instructions in section "Message Codes".
Example:

Adjusting measuring reference / tripod

1

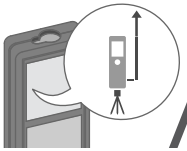


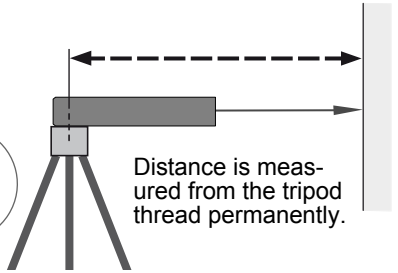


Next distance is measured from the front of the device.

Press button 2 sec and reference from front is set permanently.

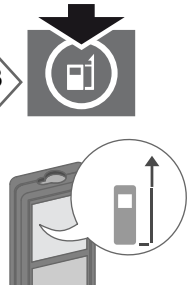
2

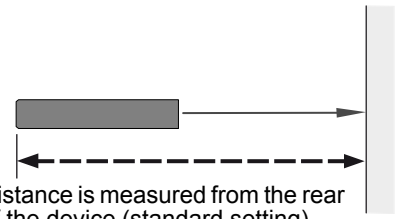




Distance is measured from the tripod thread permanently.

3

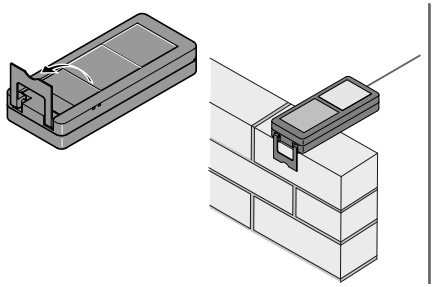


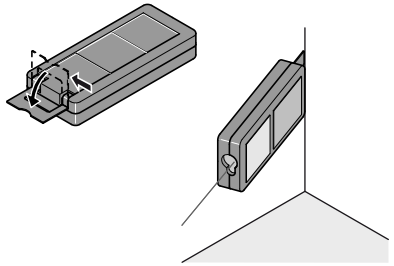


Distance is measured from the rear of the device (standard setting).

Operations

Multifunctional endpiece





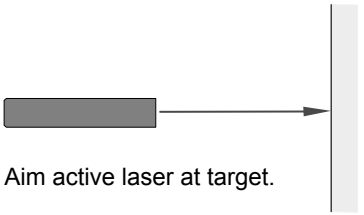
The orientation of the endpiece is automatically detected and the zero point is accordingly adjusted.

Measuring Functions

Measuring single distance

1

2



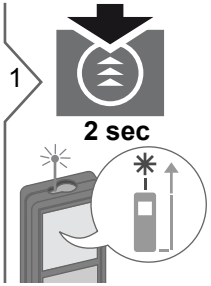
3

Tipp: To avoid jitter problems, set Timer ON and time to 1 sec.

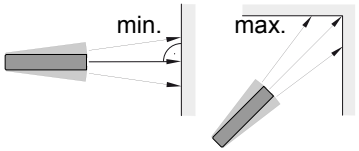
Target surfaces: Measuring errors can occur when measuring to colourless liquids, glass, styrofoam or semi-permeable surfaces or when aiming at high gloss surfaces. Against dark surfaces the measuring time increases.

Permament / Minimum-Maximum measuring

1

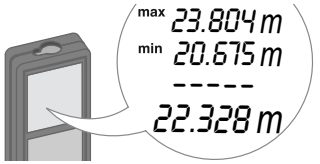


2



Used to measure room diagonals (maximum values) or horizontal distance (minimum values)

Max and min values are displayed in 1st and 2nd row. The last value measured is displayed in the main line. If no measurement is possible, 3rd row shows a line.



3

Stops permanent / minimum-maximum measuring. With pressing the equal button, the max or min value can be moved in the main line for calculation afterwards.

Add / Subtract / Multiply / Divide

1

2

The next measurement is added to the previous one.

The next measurement is subtracted from the previous one.

2

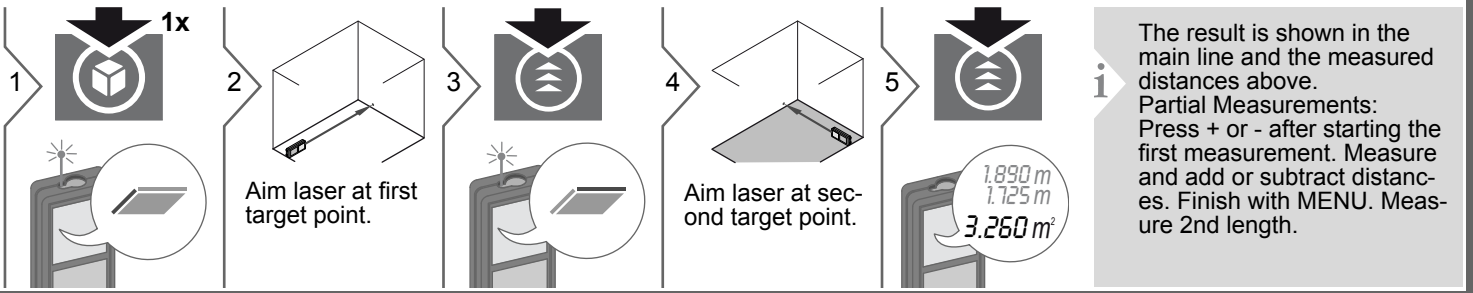
The next measurement is multiplied with previous one.

The next measurement is divided with previous one.

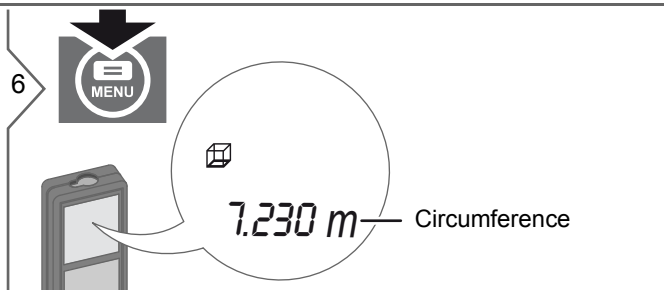
The measured value is shown in the main line. After pressing the equal button, the result is shown in the main line. This process can be repeated as required. Multiplying a length more than 3 times is not possible. The same process can be used for adding or subtracting areas or volumes. Values from memory also can be used for calculations.

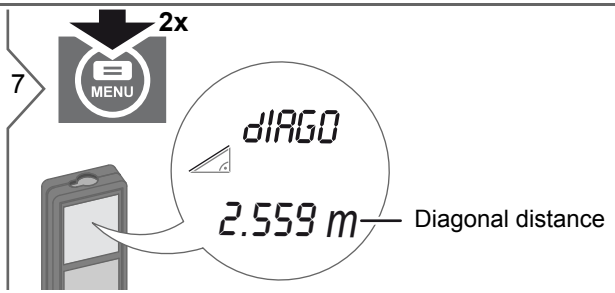
Measuring Functions

Area



The result is shown in the main line and the measured distances above.
Partial Measurements:
Press + or - after starting the first measurement. Measure and add or subtract distances. Finish with MENU. Measure 2nd length.

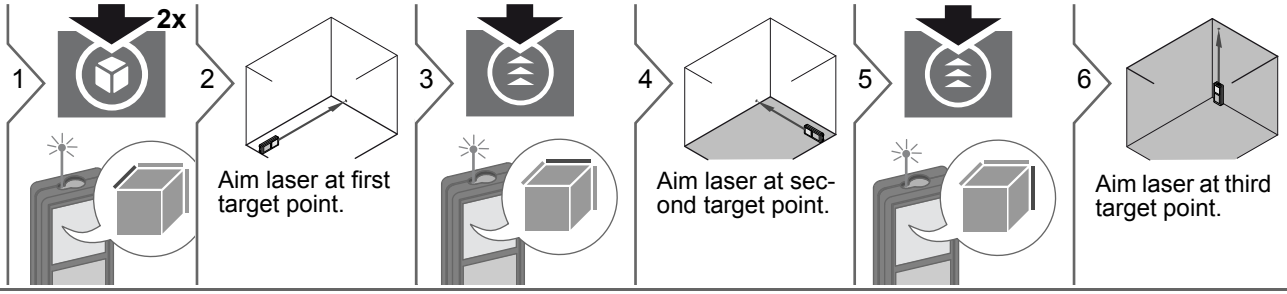


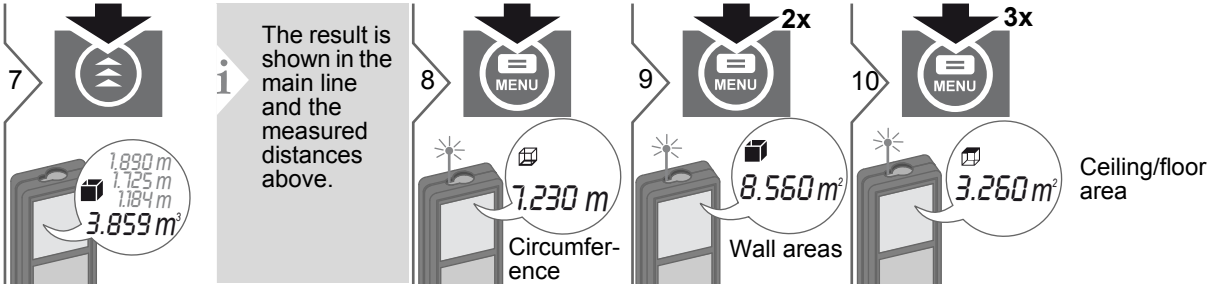


With the MENU key additional results can be selected. Press + or - to add or subtract next area measurement.

Measuring Functions

Volume



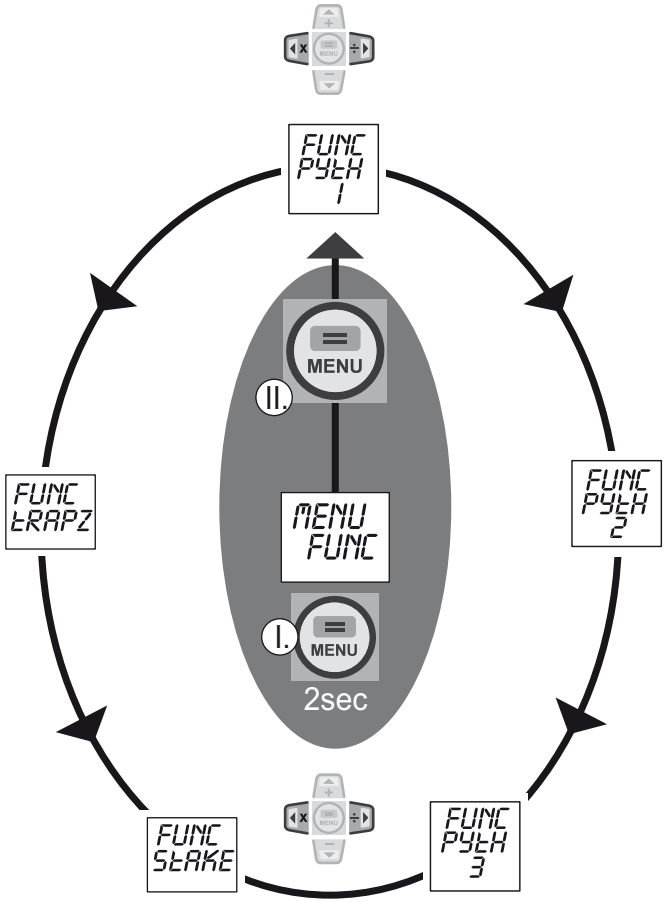


With the MENU key additional results can be selected. Press + or - to add or subtract next volume measurement.

Special Functions

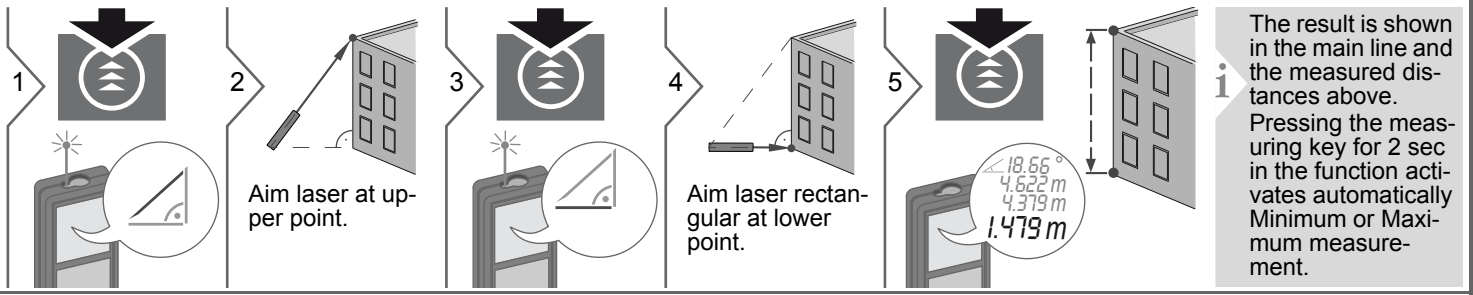
In order to increase the usability of the instrument, major functions are accessible directly via keyboard. All other functions are located in a menu structure. All special functions can directly started by pressing the On/Measure key after selection.

Following special functions are available:
- Pythagoras
- Pythagoras 2 (3 point)
- Pythagoras 3 (partial height)
- Stake out
- Trapezoid



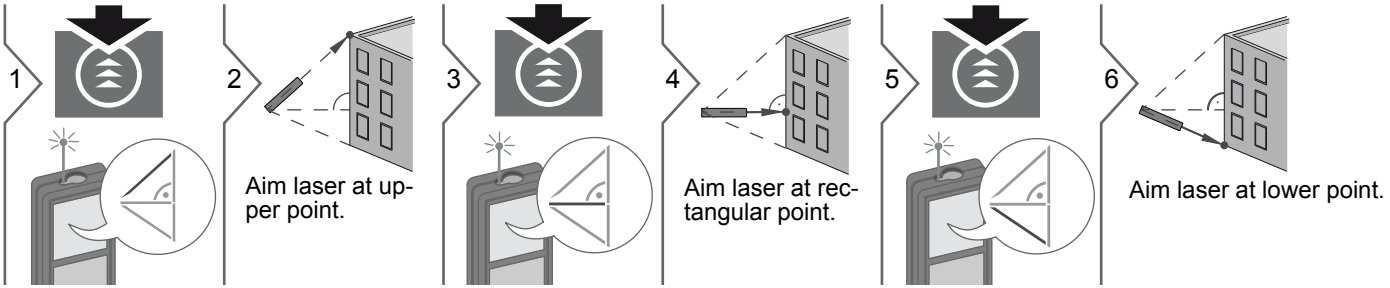
Special Functions

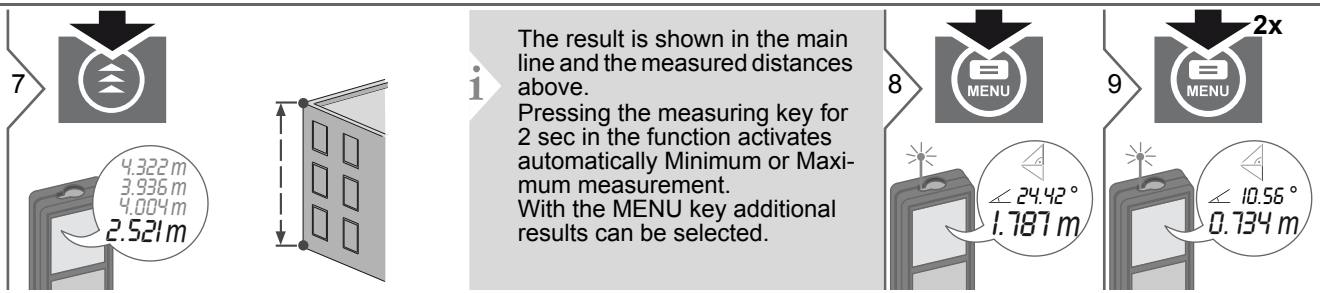
Pythagoras 1



The result is shown in the main line and the measured distances above.
Pressing the measuring key for 2 sec in the function activates automatically Minimum or Maximum measurement.

Pythagoras 2 (3-point)





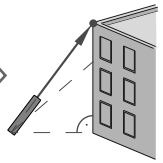
The result is shown in the main line and the measured distances above.
Pressing the measuring key for 2 sec in the function activates automatically Minimum or Maximum measurement.
With the MENU key additional results can be selected.

Special Functions

Pythagoras 3 (partial height)

1

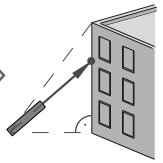
2



Aim laser at upper point.

3

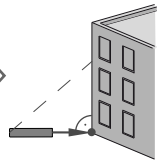
4



Aim laser at 2nd point.

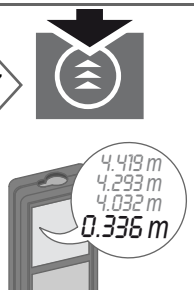
5

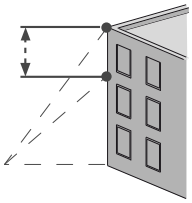
6



Aim laser at rectangular point.

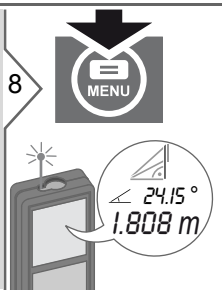
7





The result is shown in the main line and the measured distances above.
Pressing the measuring key for 2 sec in the function activates automatically Minimum or Maximum measurement.
With the MENU key additional results can be selected.

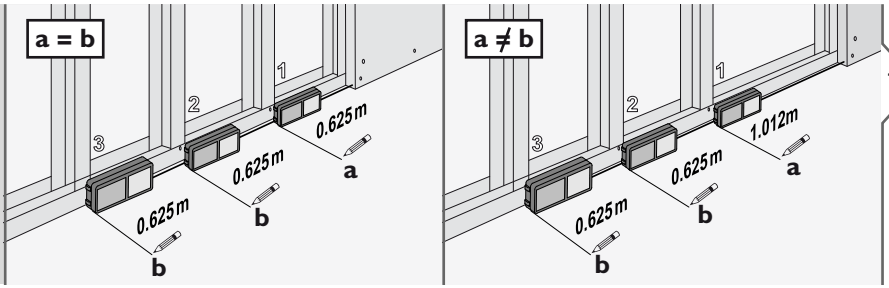
8



Special Functions

Stake out

Two different distances (a and b) can be entered to mark off defined measured lengths.



1

Start measuring

or

Change values

2

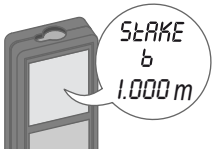
Adjust value "a".

3

Approve value "a".

4

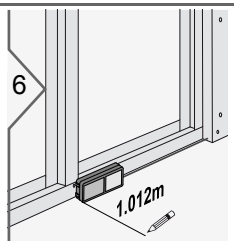
Adjust value "b".



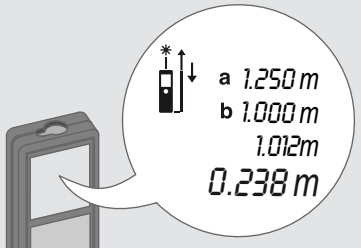
5

Approve value "b" and start measurement.

6



Move device slowly along the stake-out line. The distance to the next stake out point is displayed.



0.238 m to the next point, 1.012 m overall distance.

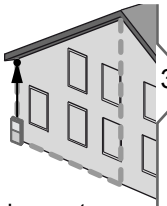
When approaching a stake out point to less than 0.1 m the instrument starts to beep.

Special Functions

Trapezoid

1

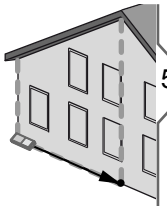
2



Aim laser at upper point.

3

4



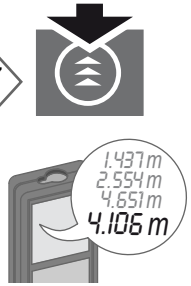
Aim laser at 2nd point.

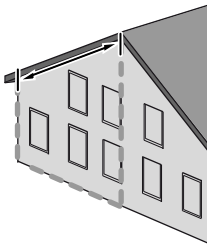
5

6

Aim laser at rectangular point.

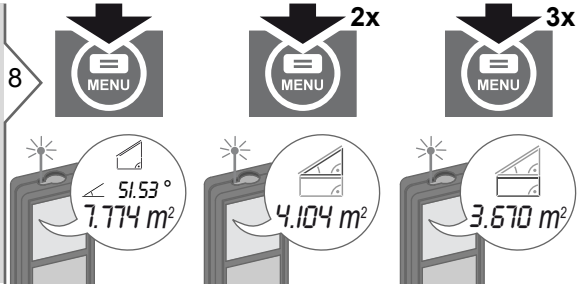
7





The result is shown in the main line and the measured distances above.
With the MENU key additional results can be selected.

8



Memory

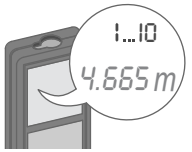
1

1x

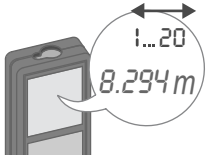
20 last displays are displayed.

2x

10 constants are displayed.



2



Navigates trough the memory.

The value from the main line can be used for further calculations.

Save constant value:

1

2 sec

2

Select position in memory.

3

Tipp: Store values like PI or the price per square meter for calculations.

Set or change value:

1

Press + and - together to start change mode.

2

Selected digit is blinking.

3

Change value with cursor keys.

4

Tipp: Change the dimensions to the required setting. Delete the dimension to have a factor without dimension.

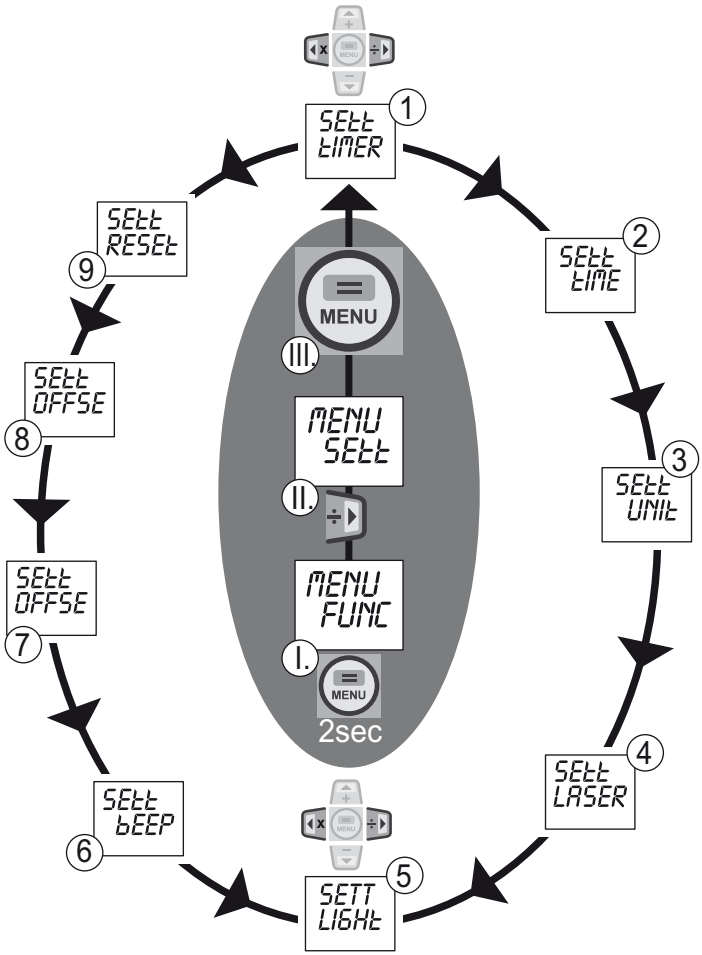
Settings

To allow a maximum of user friendliness notwithstanding flexibility, the instrument has a structured settings menu.

Following sub items are accessible:

1) Timer (On/Off)
2) Time Timer (0 – 99sec)
3) Unit (0.000m, 0.000^{0}m, 0.00m, 0.00ft, 0'00"$^{1/32}$, 0'00"$^{1/16}$, 0'00"$^{1/8}$, 0.00in, 0in$^{1/32}$, 0in$^{1/16}$, 0in$^{1/8}$)
4) Laser Continuous (On/Off)
5) Display Backlight Time (0 – 99sec, 99sec = permanent)
6) Beep (On/Off)
7) Offset (On/Off)
8) Offset value
9) Reset (No/Yes)

In order to change the setting, move to the desired item with the cursor keys, press MENU to select and change the value with the cursor keys. Afterwards close with the MENU key.
To leave the menu, press MENU for 2 seconds.



Technical Data

Distance measurement	
Typical Measuring Tolerance*	± 1.0 mm / 0.04 in ***
Maximum Measuring Tolerance**	± 2.0 mm / 0.08 in ***
Range at target plate	100 m / 330 ft
Typical Range*	80 m / 262 ft
Range at unfavourable condition ****	60 m / 197 ft
Smallest unit displayed	0.1 mm / 1/32 in
Ø laser point at distances	6 /30 / 60 mm (10 / 50 / 100 m)
General	
Laser class	2
Laser type	635 nm, < 1 mW
Protection class	IP65 (dust tight and jet water protected)
Autom. laser switch off	after 90 s
Autom. power switch-off	after 180 s
Battery durability (2 x AAA)	up to 5000 measure-ments
Dimension (H x D x W)	117 x 57 x 32 mm 4.6 x 2.4 x 1.3 in
Weight (with batteries)	138 g / 1.43 oz
Temperature range:	
- Storage	-25 to 70 °C -13 to 158 °F
- Operation	-10 to 50 °C 14 to 122 °F

* applies for 100 % target reflectivity (white painted wall), low background illumination, 25 ºC

** applies for 10 to 500 % target reflectivity, high background illumination, - 10 ºC to + 50 ºC

*** Tolerances apply from 0.05 m to 10 m with a confidence level of 95%. The maximum tolerance may deteriorate to 0.1 mm/m between 10 m to 30 m and to 0.2 mm/m for distances above 30 m

**** applies for 100 % target reflectivity, background illumination or approximately 30'000 lux

i For accurate indirect results, the use of a tripod is recommended.

Functions	
Distance measuring	yes
Min/Max measuring	yes
Permanent measuring	yes
Stake-out	yes
Addition/Subtraction	yes
Area	yes
Volume	yes
Pythagoras	2-point, 3-point, partial height
Trapezoid	yes
Multiplication/Division	yes
Adjust values	yes
Memory	20 displays / 10 constants
Beep	yes
Illuminated display	yes
Multifunctional endpiece	yes

Message Codes

If the message **Error** does not disappear after switching on the device repeatedly, contact the dealer.
If the message **InFo** appears with a number, press the Clear button and observe the following instructions:

No.	Cause	Correction
204	Calculation error	Perform measurement again.
252	Temperature too high	Let device cool down.
253	Temperature too low	Warm device up.
255	Received signal too weak, measuring time too long	Change target surface (e.g. white paper).
256	Received signal too high	Change target surface (e.g. white paper).
257	Too much back-ground light	Shadow target area.
258	Measurement outside of meas-uring range	Correct range.
260	Laser beam inter-rupted	Repeat measurement.

Care

- Clean the device with a damp, soft cloth.
- Never immerse the device in water.
- Never use aggressive cleaning agents or solvents.

Warranty

Stabila provides a two-year warranty for the Stabila LD 420.
Futher information can be found on the Internet at: **www.stabila.de**

Safety Instructions

The person responsible for the instrument must ensure that all users understand these directions and adhere to them.

Areas of responsibility

Responsibilities of the manufacturer of the original equipment:

STABILA Messgeräte
Gustav Ullrich GmbH
P.O. Box 13 40 / D-76851 Annweiler
Landauer Str. 45 / D-76855 Annweiler

USA/Canada:
STABILA Inc.
332 Industrial Drive
South Elgin, IL 60177
1.800.869.7460

The company above is responsible for supplying the product, including the User Manual in a completely safe condition.
The company above is not responsible for third party accessories.

Responsibilities of the person in charge of the instrument:

- To understand the safety instructions on the product and the instructions in the User Manual.
- To be familiar with local safety regula-tions relating to accident prevention.
- Always prevent access to the product by unauthorised personnel.

Safety Instructions

Permitted use

- Measuring distances
- Tilt measurement

Prohibited use

- Using the product without instruction
- Using outside the stated limits
- Deactivation of safety systems and removal of explanatory and hazard labels
- Opening of the equipment by using tools (screwdrivers, etc.)
- Carrying out modification or conversion of the product
- Use of accessories from other manufacturers without express approval
- Deliberate dazzling of third parties; also in the dark
- Inadequate safeguards at the surveying site (e.g. when measuring on roads, construction sites, etc.)
- Deliberate or irresponsible behaviour on scaffolding, when using ladders, when measuring near machines which are running or near parts of machines or installations which are unprotected
- Aiming directly in the sun

Hazards in use

⚠ WARNING

Watch out for erroneous measurements if the instrument is defective or if it has been dropped or has been misused or modified. Carry out periodic test measurements. Particularly after the instrument has been subject to abnormal use, and before, during and after important measurements.

⚠ CAUTION

Never attempt to repair the product yourself. In case of damage, contact a local dealer.

⚠ WARNING

Changes or modifications not expressly approved could void the user's authority to operate the equipment.

Limits of use

i Refer to section "Technical data".

The device is designed for use in areas permanently habitable by humans. Do not use the product in explosion hazardous areas or in aggressive environments.

Disposal

⚠ CAUTION

Flat batteries must not be disposed of with household waste. Care for the environment and take them to the collection points provided in accordance with national or local regulations.

The product must not be disposed with household waste.

Dispose of the product appropriately in accordance with the national regulations in force in your country.

Adhere to the national and country specific regulations.

Product specific treatment and waste management can be downloaded from our homepage.

Electromagnetic Compatibility (EMC)

⚠ WARNING

The device conforms to the most stringent requirements of the relevant standards and regulations.

Yet, the possibility of causing interference in other devices cannot be totally excluded.

Safety Instructions

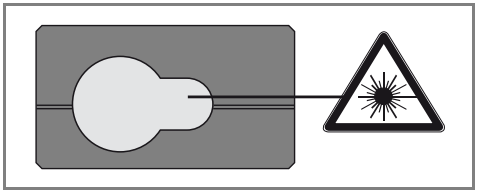
FCC statement (applicable in U.S.)

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications.

However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Laser classification



The device produces visible laser beams, which are emitted from the instrument:

It is a Class 2 laser product in accordance with:

- IEC60825-1 : 2007 „Radiation safety of laser products“

Laser Class 2 products:

Do not stare into the laser beam or direct it towards other people unnecessarily. Eye protection is normally afforded by aversion responses including the blink reflex.

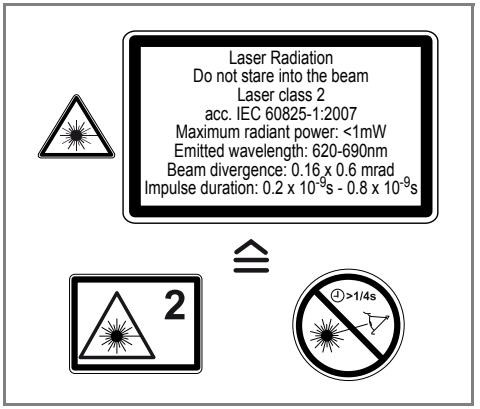
⚠ WARNING

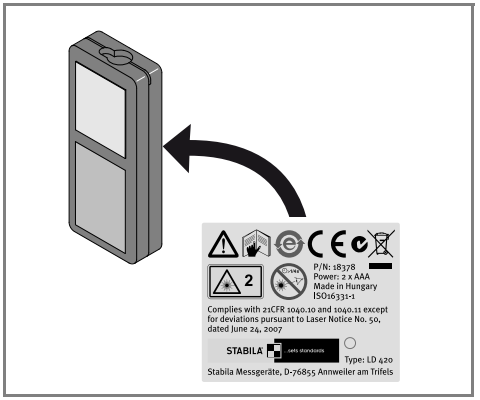
Looking directly into the beam with optical aids (e.g. binoculars, telescopes) can be hazardous.

⚠ CAUTION

Looking into the laser beam may be hazardous to the eyes.

Labelling




P/N: 18378
Power: 2 x AAA
Made in Hungary
ISO16331-1
Complies with 21CFR 1040.10 and 1040.11 except for deviations pursuant to Laser Notice No. 50, dated June 24, 2007
STABILA
Type: LD 420
Stabila Messgeräte, D-76855 Annweiler am Trifels

Subject to change (drawings, descriptions and technical data) without prior notice.